# The Impact of Minecraft-Based Gamification on Islamic Education Learning Outcomes: Evidence from a Santichon Islamic School (SIS) Bangkok Thailand

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**Abstract**

**Research Objective –** This study aims to evaluate the effectiveness of gamified learning media utilizing Microsoft Minecraft in enhancing student learning outcomes in Islamic education at Santichon Islamic School, Bangkok, Thailand. The research addresses the need for innovative pedagogical approaches to improve student engagement and performance in religious education, particularly among digital-native learners.

**Methodology –** Employing a quasi-experimental quantitative design, the study involved 50 students divided equally into experimental and control groups. The experimental group received instruction through Minecraft-based gamified media, while the control group followed conventional teaching methods. A pre-test and post-test were administered, and the data were analyzed using paired and independent sample t-tests via SPSS to assess learning gains and inter-group differences.

**Findings –** The results indicated a statistically significant improvement in the experimental group's post-test scores compared to the control group ($p < 0.01$). Students in the Minecraft group demonstrated higher engagement and a mean learning gain more than double that of the control group. These findings confirm the positive impact of gamification on cognitive learning outcomes in Islamic education.

**Research Implications/Limitations –** This study highlights the pedagogical potential of integrating gamified digital tools in Islamic curricula. However, the research was limited to one institution and short-term assessment. Broader studies across diverse settings and longer durations are needed.

**Originality/Value –** The study contributes to the limited empirical literature on gamification in Islamic education, offering evidence-based insight into the effectiveness of Minecraft as a digital instructional tool in religious learning environments.

## INTRODUCTION

Education serves as a foundational pillar in the development of individual character and personality. Within the framework of Islamic education, its objectives extend beyond the transmission of knowledge to encompass the inculcation of ethical conduct, spiritual awareness, and social responsibility.[1] The effectiveness of Islamic education is, therefore, largely influenced by the quality of pedagogical strategies and the relevance of instructional media.[2] In the digital age, where learners are increasingly exposed to technology from an early age, it becomes imperative to integrate innovative and engaging learning media that align with contemporary learning preferences.[3]

Recent advances in information and communication technologies (ICT) have dramatically transformed the educational landscape. Digital platforms, online learning environments, and interactive media have redefined the modes of knowledge delivery, teacher-student interaction, and student engagement.[4] The accessibility of internet-connected devices enables students to independently explore diverse educational resources, including e-books, educational videos, and web-based content, thereby promoting learner autonomy and broadening academic exposure.[5]

Among the most promising innovations in educational technology is the concept of gamification—the integration of game elements such as points, badges, leaderboards, missions, and avatars into non-game contexts.[6] In the educational domain, gamification is recognized for its potential to enhance student motivation, foster deeper engagement, and improve learning outcomes.[7] Numerous studies have demonstrated that gamified learning environments can stimulate intrinsic motivation and facilitate the acquisition of complex knowledge through interactive and enjoyable activities.[8]

[1] N. A. R. Fawaid, A. ., Kholil, M. ., & Dewi, "The Role of Culturally-Responsive Gamification to Improve Multiethnic Students' Self-Engagement in Islamic Education," *Al-Fikru: Jurnal Pendidikan Dan Sains* 5, no. 2 (2024): 267–275, https://doi.org/https://doi.org/10.55210/al-fikru.v5i2.1868.

[2] A. Aini, S., Rusman, R., & Asrori, *Model Scramble Pada Pelajaran Pendidikan Agama Islam Dalam Membentuk Berpikir Kritis Siswa* (Gresik: Zamron Pressindo, 2024).

[3] S. N. Attarwiyah, N. M., Wasi'ah, I. R., & Jennah, "Bridging Tradition and Technology: Gamification in Modern Islamic Boarding Schools," *Journal of Social Studies and Education* 2, no. 2 (2025): 97–110, https://doi.org/https://doi.org/10.61987/jsse.v2i2.668.

[4] R. Shuhaimi, M. A. A., Saleh, N. S., Rahman, A. A., & Yusof, "Use of Minecraft Education Edition in the Field of Islamic Education," *International Journal of Academic Research in Business and Social Sciences* 13, no. 12 (2023): 4413–4428, https://doi.org/https://doi.org/10.6007/IJARBSS/v13-i12/20103.

[5] R. A. H. Nur, M., Bin, F., & Osman, "Applying Minecraft to Learn Arabic Language and Islamic Studies: Literature Review," in *European Proceedings of Educational Sciences*, ed. & N. H. M. Saad A. Bidin, N. Mohamad Ayob, Z. Mohd Sulaiman, Y. S. Chan (European Publisher, 2023), 532–42, https://doi.org/https://doi.org/10.15405/epes.23097.48.

[6] K.K.W. Chan, C.K.Y., Lee, "The AI Generation Gap: Are Gen Z Students More Interested in Adopting Generative AI Such as ChatGPT in Teaching and Learning than Their Gen X and Millennial Generation Teachers?," *Smart Learn Environ* 10, no. 60 (2023), https://doi.org/https://doi.org/10.1186/s40561-023-00269-3.

[7] R. Asrori, A., Lema, I. H. P., & Rusman, "Implementasi Metode Mind Mapping Berbasis Software Gitmind Pada Mata Pelajaran Pendidikan Agama Islam Di Sekolah Menengah Kejuruan Negeri 8 Surabaya," *Al-Ulum Jurnal Pemikiran Dan Penelitian Ke Islaman* 10, no. 3 (2023): 267–78.

[8] Fawaid, A. ., Kholil, M. ., & Dewi, "The Role of Culturally-Responsive Gamification to Improve Multiethnic Students' Self-Engagement in Islamic Education."

In the context of Islamic education, the adoption of gamification addresses several pedagogical challenges. Traditional teaching approaches, which often rely on passive instruction and rote memorization, may fall short of capturing students' interest, particularly among digital-native learners. The implementation of gamified learning tools allows educators to present Islamic content in more dynamic and personalized ways, thereby increasing relevance and retention.[9] Moreover, adaptive gamification systems are capable of tailoring learning tasks according to individual student progress, supporting differentiated instruction and promoting equitable learning opportunities.[10]

One noteworthy platform that has gained traction in gamified learning is Microsoft Minecraft.[11] Initially developed as a sandbox video game, Minecraft Education Edition has evolved into a flexible educational tool, enabling students to explore, collaborate, and construct knowledge within immersive virtual environments.[12] Its applicability in Islamic education is particularly promising, as educators can design scenarios and tasks that align with Islamic values, principles, and historical narratives.[13] Through experiential learning, abstract religious concepts can be concretized, promoting critical thinking and moral reasoning.[14]

Santichon Islamic School (SIS) in Bangkok, Thailand, provides a unique case for exploring gamification in Islamic education. As part of its digital transformation initiatives, SIS has equipped its students with Microsoft 365 accounts, granting them access to Minecraft and other educational tools. This infrastructure creates fertile ground for developing and integrating gamified instructional media into the Islamic studies curriculum. Leveraging Minecraft not only aligns with students' digital tendencies but also introduces pedagogical novelty that enhances classroom engagement and learning efficacy.[15] This study, therefore, seeks to evaluate the effectiveness of gamification-based learning media using Microsoft Minecraft in enhancing students' learning outcomes in Islamic Education at Santichon Islamic School, Thailand.

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[9] Attarwiyah, N. M., Wasi'ah, I. R., & Jennah, "Bridging Tradition and Technology: Gamification in Modern Islamic Boarding Schools."

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[11] J. Miri, D. H., & Macke, "Gamification, Motivation, and Engagement at Work: A Qualitative Multiple Case Study," *European Business Review* 34, no. 2 (2022): 263–276, https://doi.org/https://doi.org/10.1108/EBR-04-2020-0106.

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[15] Shuhaimi, M. A. A., Saleh, N. S., Rahman, A. A., & Yusof, "Use of Minecraft Education Edition in the Field of Islamic Education."

## METHOD

This study employed a quantitative approach with a quasi-experimental design to measure the effectiveness of gamified learning media using Microsoft Minecraft in improving students' learning outcomes in Islamic Education. This design was chosen as it allows for treatment to be given to a selected experimental group without full randomization.[16] The population of this study consisted of junior-level students at Santichon Islamic School, Bangkok, Thailand. The sample was selected purposively and consisted of two classes: one as the experimental group that used Minecraft Education Edition during instruction, and the other as the control group that used conventional teaching methods. Each group consisted of 25 students.

The primary research instrument was a learning achievement test consisting of a pre-test and post-test, developed based on the core competencies outlined in the Islamic Education curriculum. The content validity of the instrument was assessed through expert judgment by subject specialists, and the empirical validity was tested using Pearson Product-Moment correlation. The instrument's reliability was determined using Cronbach's Alpha, with a minimum reliability threshold of 0.7.

Data collected from the pre-test and post-test were analyzed using t-tests: a paired sample t-test to examine the improvement within each group, and an independent sample t-test to identify the significant differences between the experimental and control groups. All statistical analyses were conducted using the latest version of SPSS. To ensure internal validity, both classes received the same instructional duration, learning materials, and objectives; the only variable that differed was the instructional media. This research also adhered to ethical standards, including informed consent from participants, confidentiality of student identity, and the right to withdraw from the study at any point without any consequences.[17]

## RESULTS AND DISCUSSION
### Results

To investigate the impact of gamified learning using Microsoft Minecraft on students' learning outcomes in Islamic Education, both descriptive and inferential statistical analyses were conducted. The data were collected from 50 students divided into two groups of equal size. The experimental group (n = 25) received Minecraft-based gamified instruction, while the control group (n = 25) was taught using a conventional approach.

The descriptive statistics, presented in Table 1, reveal that both groups began with comparable pre-test scores, indicating a relatively balanced level of prior knowledge between the experimental group (M = 62.40, SD = 8.52) and the control group (M = 61.80, SD = 8.33). However, upon completion of the instructional period, the post-test scores reflected a notable divergence between the two groups. The experimental group achieved a post-test average of 82.60 (SD = 7.35), representing a gain of 20.20 points, whereas the control group

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[16] John W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, 4th ed. (Boston: Pearson. inc, 2012).
[17] K. Cohen, L., Manion, L., & Morrison, *Research Methods in Education*, 8th ed. (London: Routledge, 2018), https://doi.org/https://doi.org/10.4324/9781315456539.

registered a post-test average of 70.40 (SD = 7.88), yielding an improvement of only 8.60 points.

Table 1. Descriptive Statistics of Pre-test and Post-test Results

| Group | Test Type | N | Mean Score | Standard Deviation |
|---|---|---|---|---|
| Experimental | Pre-test | 25 | 62.40 | 8.52 |
| Experimental | Post-test | 25 | 82.60 | 7.35 |
| Control | Pre-test | 25 | 61.80 | 8.33 |
| Control | Post-test | 25 | 70.40 | 7.88 |

The results of the paired sample t-test (presented in Table 2) confirm that both the experimental and control groups experienced statistically significant improvements in their learning outcomes from pre-test to post-test ($p < 0.001$). However, the experimental group demonstrated a much larger gain (Mean Difference = 20.20, t = 12.33) compared to the control group (Mean Difference = 8.60, t = 5.47). These results underscore the superior effectiveness of the Minecraft-based gamified instruction in enhancing students' learning outcomes relative to the traditional approach.

Table 2. Paired Sample t-Test Results

| Group | Mean Difference | t-value | Sig. (2-tailed) |
|---|---|---|---|
| Experimental | 20.20 | 12.33 | 0.000 ** |
| Control | 8.60 | 5.47 | 0.000 ** |

To further assess the significance of post-test differences between the experimental and control groups, an independent sample t-test was conducted (Table 3). The results reveal a highly significant difference (t = 5.86, $p < 0.001$), indicating that students exposed to the Minecraft-based gamified instruction achieved significantly higher learning outcomes than those taught using traditional methods. These findings align with prior studies, such as those conducted by Arufe-Giráldez, which have similarly demonstrated the potential of gamification strategies to foster higher levels of academic performance across a range of disciplines.[18]

Table 3. Independent Sample t-Test Results (Post-test Scores)

| Group Comparison | Mean (Post-test) | t-value | Sig. (2-tailed) |
|---|---|---|---|
| Experimental vs Control | 82.60 vs 70.40 | 5.86 | 0.000 ** |

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[18] Arufe Giráldez V, Sanmiguel-Rodríguez A, Ramos Álvarez O, "Can Gamification Influence the Academic Performance of Students? Sustainability."

Figure 1. Mean Pre-test and Post-test Scores per Group
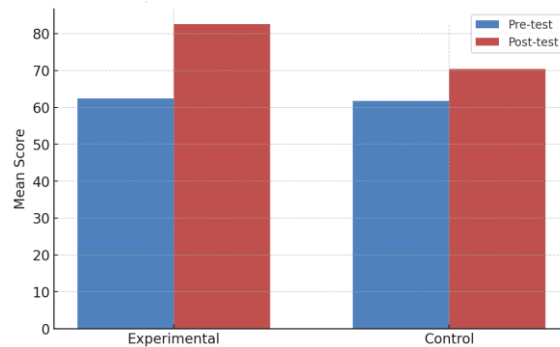


The first bar chart illustrates that the post-test score of the experimental group (82.60) was substantially higher than its pre-test score (62.40), while the control group also demonstrated an increase from 61.80 to 70.40.

Figure 2. Mean Score Differences (Post-test vs Pre-test)
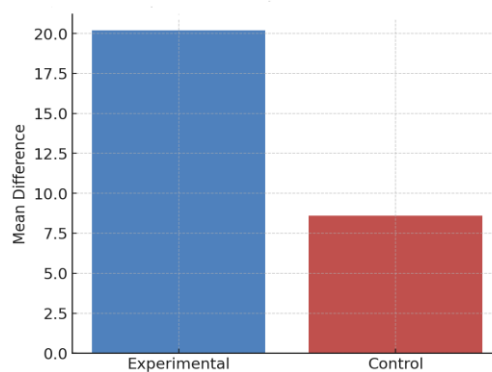


The second chart further emphasizes the magnitude of improvement achieved by both groups. It shows that the experimental group demonstrated a mean score gain of 20.20 points from pre-test to post-test, which is more than twice the gain observed in the control group. In contrast, the control group registered a relatively modest improvement of 8.60 points. This substantial difference suggests that the Minecraft-based gamification approach had a considerably stronger impact on students' learning outcomes, highlighting its potential effectiveness in fostering deeper engagement and understanding in the context of Islamic Education.

## Discussion

The findings of this study provide compelling empirical evidence that gamified learning using Microsoft Minecraft significantly enhances student outcomes in Islamic Education. The experimental group exhibited a substantial mean gain of 20.20 points (from M = 62.40 to M = 82.60), whereas the control group only improved by 8.60 points. Both within- and between-group analyses revealed highly significant differences ($p < 0.001$), confirming that Minecraft-based gamified instruction is markedly superior to traditional methods.

These results are consistent with the broader literature on gamification and academic performance. For example, Arufe-Giráldez et al. found that gamification strategies can significantly improve academic performance across diverse educational settings.[19] Similarly, a systematic review by Ruiz, Sanchez, and Figueredo highlights the role of gamified learning in boosting student engagement and motivation, reinforcing our finding that Minecraft's interactive environment promotes deeper cognitive involvement.[20]

The superior performance of the experimental group can be linked to several pedagogical mechanisms inherent in Minecraft. Its constructivist approach allows students to build and explore virtual spaces, effectively transforming abstract Islamic content into interactive, experiential knowledge—a finding that is in line with the work of Fawaid, Kholil, and Dewi, who demonstrated that culturally responsive gamification can foster active learning within the context of Islamic Education.[21] Moreover, Minecraft's collaborative and problem-solving elements align with research in educational technology suggesting that digital-native students, especially those belonging to Generation Z, benefit deeply from interactive, multimodal learning environments.[22]

In contrast, the control group's relatively modest improvement highlights the limitations of traditional, lecture-based instruction. While such approaches can establish a basic level of understanding, they often fail to sustain attention or stimulate higher-order thinking. This shortfall has been increasingly emphasized in comparative studies focusing on interactive versus didactic instructional methods.[23]

Importantly, the Moodle and Minecraft combination appears to effectively address this gap by leveraging engagement through play, visual narratives, and context-based simulations. These features enable students to internalize complex Islamic values and concepts more effectively than conventional methods. The results of this study, therefore, support the growing call for the integration of interactive gamification in curricula, especially within value-based disciplines like Islamic Education. In this regard, schools and curriculum developers should consider adopting platforms such as Minecraft to create more student-centered, immersive learning environments that are aligned with the needs and characteristics of contemporary learners.

**CONCLUSION**

This study provides strong empirical evidence that Minecraft-based gamification significantly improves learning outcomes in the context of Islamic Education. The experimental group, which engaged with the Minecraft platform, demonstrated a marked

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[19] Arufe Giráldez V, Sanmiguel-Rodríguez A, Ramos Álvarez O.

[20] Luis Figueredo. Juan Ruiz, Miguel Sanchez, "Gamification and Student Engagement: A Systematic Literature Review," *Frontiers in Education* 9 (2024): 276, https://doi.org/https://doi.org/10.3389/feduc.2024.1466926.

[21] Fawaid, A. ., Kholil, M. ., & Dewi, "The Role of Culturally-Responsive Gamification to Improve Multiethnic Students' Self-Engagement in Islamic Education."

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[23] Miri, D. H., & Macke, "Gamification, Motivation, and Engagement at Work: A Qualitative Multiple Case Study."

improvement of 20.20 points, substantially exceeding the 8.60-point gain observed in the control group taught through traditional methods. The statistical analyses confirmed that these differences were highly significant ($p < 0.001$), underscoring the superior efficacy of the gamified approach.

These findings highlight the potential of interactive, constructivist, and immersive digital environments to foster deeper engagement and understanding of abstract religious concepts, aligning with a growing body of literature that supports the effectiveness of gamification across diverse educational settings. The ability of Minecraft to transform abstract material into concrete and meaningful learning experiences positions it as a valuable pedagogical tool for 21st-century learners, particularly within the domain of Islamic Education.

In conclusion, the results of this study support the integration of gamified platforms like Minecraft into formal Islamic education curricula. Such approaches not only enhance academic performance, but also foster active learning, collaboration, and critical thinking, making them highly suitable for digital-native students. Future research may build upon these findings by exploring long-term learning impacts, the role of individual learner characteristics, and the scalability of this approach across other subject areas and educational settings.

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